1943

UNITED STATES DEPARTMENT OF AGRICULTURE
Food Distribution Administration
and
Agricultural Research Administration
in cooperation with
THE CLEMSON AGRICULTURAL COLLEGE

# SAW GINNING VERSUS ROLLER GINNING FOR LONG STAPLE UPLAND COTTON 1/

With the recent increased planting of extra staple American upland cotton, new problems in ginning have arisen. Information is needed on the best methods of preserving the quality of this cotton in ginning. The relative merits of saw and roller ginning have become a subject of much discussion, and the U. S. Cotton Ginning Laboratory, Stoneville, Miss., was called upon to investigate this problem. A number of comparative saw- and roller-gin tests have been made at Stoneville over a period of years on medium and long staple cottons. In these tests, it was found that roller ginning cleaned the seed closer and greatly increased the lint turn-out as compared with saw ginning. This extra material consisted principally of foreign matter, aborted seed motes, and short fibers; the lint was generally classed as "Spotted" and as being of rough preparation, whereas cotton from the saw-gin was free from spots and smoother and brighter in appearance than that from the roller-gin. In spinning tests, the saw-ginned lint usually gave slightly stronger and frequently smoother yarns, and consistently yielded considerably less manufacturing waste than the roller-ginned cotton 2/.

## NEED FOR MORE STUDIES ON EXTRA LONG STAPLE COTTONS

Even though these tests indicated that saw ginning, when properly performed, provided lint of superior spinning quality to roller-ginned lint, many growers of extra long staple cotton in the irrigated region of the Cotton Belt reported that buyers of their cotton could find a more ready market at higher prices for roller- than for saw-ginned cotton. As a consequence, the roller-type gin was used in ginning much of the 1942 cotton crop. In the meantime, the U. S. Cotton Ginning Laboratory was requested by producers and ginners to made additional saw- and roller-ginning studies in the West with a view of

---

1/ The ginning tests here reported were made in cooperation with the Esperanza Cooperative Gin Association, Esperanza, Tex., by staff members of the U. S. Cotton Ginning Laboratory. The spinning tests were made at the Cotton Testing Laboratory, Clemson, S. C., in cooperation with the Clemson Agricultural College, under the supervision of John M. Cook, Associate Cotton Technologist. This report on the tests was prepared by Francis L. Gerdes and Malcolm E. Campbell, Senior Cotton Technologists, Cotton and Fiber Branch, Food Distribution Administration, in collaboration with Charles A. Bennett, Senior Mechanical Engineer, and James S. Townsend, Technologist, Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration.

2/ Ginning Long Staple American Upland Cotton, Agr. Mktg. Admin., Bur. Agr. Chem. & Eng., and Bur. Plant Industry, 1942 (Mimeographed).

determining definitely the relative merits of saw- and roller- ginning Coker-Wilds cotton grown under the irrigated conditions. Through the cooperation of cotton growers in the Esperanza, Tex., area, a series of ginning tests, designed to provide the information needed by growers of the extra long staple variety of cotton, was made on early- and late-season harvested Coker-Wilds cotton on saw- and roller-gin stands in a producer-owned ginning plant.

A complete study of the problem of saw versus roller ginning for long staple cotton should include an analysis of both the cost factors involved for each type of ginning and the relative prices received for the ginned lint. Because of the lack of sufficient data for such an analysis, this report should be considered as preliminary in nature and as dealing primarily with the quality of the lint produced by the two methods of ginning. It is recognized, however, that a real need exists for an economic analysis of the problem and it is planned to conduct such a study at the first opportunity.

## GINNING AND FIBER TESTING PROCEDURE

Triplicate ginnings, involving three different lots of Coker-Wilds 13 cotton harvested early in the season, and similar lots harvested late in the season, were made on one stand of a modern 4-stand, 80-saw gin outfit and on all the stands in a new type 8-stand, 40-inch roller gin plant. The saw gin was operated with a saw speed of 575 revolutions per minute and the speed of the crank on the roller gin was 780 revolutions per minute. The seed cotton used in these tests was all cleaned with an extractor type cleaner feeder prior to ginning. Observations were made on the gin turn-out, capacity, and other elements of ginning each lot of cotton. At the conclusion of the ginning tests on the late-season cotton, lint samples from all lots were classed according to the official cotton standards and were subjected to fiber and spinning tests.

The fiber tests included determinations of upper half-mean length, mean length, length uniformity, and fiber strength. The spinning tests made are described in detail later in the report.

## COMPARATIVE TURN-OUT AND RATE OF GINNING

The roller gin consistently gave a higher gin turn-out than the saw gin with the Coker-Wilds cotton employed in the test here reported. This extra material was composed primarily of foreign matter, aborted seed motes, and short fibers; it averaged 6 pounds per 500-pound bale for all lots ginned (table 1). This extraneous material was considerably less in these tests than in the tests previously reported for medium and long staple cottons. The difference in turn-out between the two methods of ginning for the two series of tests is explainable. Coker-Wilds 13 cottonseed generally are less fuzzy and of considerably lower linters content than the seed of most of the other varieties of cotton employed in the previous tests; therefore, roller ginning, which usually gins seed closer than saw ginning, did not have the opportunity to increase turn-out as much or to add as much substaple to the lint of this cotton as was the case in the tests on the shorter staple cottons. Moreover, because of the difference

Table 1.--Gin turn-out, rate of ginning, classification, and results of fiber tests of early- and late-season pickings, saw- and roller-ginned cottons

| Stage of harvesting and type of gin | Gin turn-out | Lint ginned per stand per hour | Classer's designation of: Grade 1/ | Staple length | Results of fiber tests: Upper half mean length | Uniformity index | Tensile strength |
|---|---|---|---|---|---|---|---|
| | Percent | Pounds | Code points | 1/32 in. | Inches | Percent | 1,000 pounds per sq. in. |
| Early-season cottons: | | | | | | | |
| Saw gin | 32.8 | 458 | 4.3 | 44.0 | 1.26 | 80.6 | 85.7 |
| Roller gin | 33.2 | 44 | 5.7 | 43.7 | 1.25 | 76.9 | 84.5 |
| Difference | 0.4 | -414 | -1.4 | -0.3 | -0.01 | -3.7 | -1.2 |
| Late-season cottons: | | | | | | | |
| Saw gin | 34.2 | 457 | 6.0 | 38.7 | 1.21 | 76.4 | 82.9 |
| Roller gin | 34.6 | 44 | 7.0 | 38.7 | 1.24 | 74.7 | 82.3 |
| Difference | 0.4 | -413 | -1.0 | 0 | 0.03 | -1.7 | -0.6 |
| All cottons: | | | | | | | |
| Saw gin | 33.5 | 458 | 5.2 | 41.3 | 1.23 | 78.5 | 84.3 |
| Roller gin | 33.9 | 44 | 6.3 | 41.2 | 1.24 | 75.8 | 83.4 |
| Difference 2/ | * 0.4 | *-414 | *-1.1 | -0.1 | 0.01 | *-2.7 | -0.9 |

1/ 4 = SM; 5 = M; 6 = SLM; and 7 = LM. All roller gin samples were designated "Spotted" and for this reason reduced one grade in converting to numerical values for the averages shown.

2/ Highly significant differences are denoted by an asterisk* (odds over 99 to 1).

in seed fuzziness, the Coker-Wilds seed was shed by the seed grids of the gins at a relatively higher rate than the seed of the other cottons. Also, the seed grids of the gins employed in the recent tests were so adjusted and operated that the most effective shedding of the seed possible could be accomplished to prevent the passage of extraneous material to the ginned lint.

The rate of ginning of the 80-saw gin stand used in these tests was more than 10 times as great as that of one roller gin employed in the tests in spite of the fact that every effort was made to make the roller gin shed the ginned seed more readily. The relatively low ginning rate of the roller gin consequently makes the gin operating costs, particularly the item of labor costs, considerably higher than similar operating costs of the saw gin. In 1942 the ginning rates per hundredweight of seed cotton in this area for saw and roller ginning were 26 and 70 cents, respectively. These rates may not reflect actual differences in costs, because the ginning rate for roller gins evidently contemplated the ginning of American-Egyptian cotton, which can be ginned at a rate 25 to 40 percent greater than Coker-Wilds.

## COMPARATIVE GRADE AND STAPLE LENGTH

The roller-ginned samples were designated as "Spotted" and rough, and they averaged more than a grade lower in classification than the saw-ginned samples (table 1). The grade difference was greater for the early- than for the late-season cottons. The saw-ginned samples were smoother and brighter in appearance but contained relatively more neps than the roller-ginned samples.

The classifications failed to reveal any difference in the average staple length of the saw- and roller-ginned samples. With both types of gins, the early season samples averaged about 1-3/8 inches, and the late season, 1-7/32 inches in staple length. These results definitely confirmed previous observations to the effect that saw ginning will preserve fiber length as satisfactorily as roller ginning for the long staple upland varieties of cotton.

## COMPARATIVE FIBER QUALITY

Fibograph determinations reveal that although there was no real difference in upper half mean lengths of the samples ginned by the two types of gins, the roller gin showed a slightly but consistently lower uniformity index than the saw gin. As mentioned previously, the higher turn-out obtained with the roller gin was due partly to additional short fiber, and this appears to be reflected in the lower uniformity index.

The roller-ginned samples averaged slightly but not siginificantly lower in fiber strength than the saw-ginned samples.

## COMPARATIVE SPINNING QUALITY

Although the classification and fiber test results would generally provide a fairly good indication of the relative difference in quality of the saw- and roller-ginned samples, spinning tests definitely give an over-all measure of the physical factors which ultimately determine the usefulness of cotton as well as its value. Manufacturing waste, yarn strength and appearance, and general manufacturing performance are the principal items with which spinners are concerned in making different classes of goods. The spinning test results here reported should contribute, therefore, to a better understanding of the relative merits of saw and roller ginning from the standpoint of manufacturing extra long staple American upland cotton.

### Method of Procedure

The 12 lots of ginned lint, which included triplicate lots of saw- and roller-ginned Coker-Wilds 13 picked early in the season, and the same combination of lots picked late in the season, were subjected to spinning tests at the Department's Cotton Testing Laboratory at Clemson, S. C.

These tests consisted of spinning 60s, 80s, and 100s combed warp yarn from each lot, and testing the yarns for strength, size, and appearance. The percentages of each type of waste removed by the various cleaning machines were determined, and counts were made of the number of neps in 180 square inches of card web for each lot. Observations were made of the general manufacturing performance at each processes.

The weights of stock made at the various machines are shown in figure 1. The organization and machine speeds and settings used conform to recognized commercial manufacturing practices for the spinning of medium-fine combed yarns. First, the test lots were passed through a hopper-feeder to open and fluff the cotton, which was then allowed to condition in a bin for at least 24 hours. It was then run again through the hopper-feeder, and made into laps on a breaker picker equipped with a two-blade beater. A finisher picker with a similar beater completed the opening and picking process.

Carding was accomplished at the rate of about 3.1 pounds per hour, producing a 36-grain sliver with the 27-inch doffer turning at the rate of 4 revolutions per minute. The flats were driven at a speed of 3.25 inches per minute. A sliver and a ribbon lap machine prepared the cotton for combing, which was carried out on a type D-4 machine operating at 81 nips per minute. The comber was set, on the basis of trial tests, to remove between 18 and 20 percent waste from the first lot combed, and the same settings and timings were used for all of the other lots in the test.

One process of drawing and four of roving produced two sizes of jack frame roving (14 and 20 hank) from each lot. From this material the three counts of yarn were spun on a ring frame equipped with a conventional drafting

system. The following are some of the pertinent details of the spinning operation: Ring size, 1-1/2 inch, No. 2 flange. Length of traverse, 1-1/2 inches. Filling wind used on warp bobbins. Yarn spun from double roving in the creel, with leather-covered front and back top rolls and Washburn middle rolls. Spindle speed, 8,500 revolutions per minute for all yarns. Twist multiplier, 3.75 for all yarns.

Fifty skeins were reeled from each count of yarn spun from each lot, conditioned for at least 4 hours on rotary racks in an atmosphere of 65% R.H. at 70°F., broken on an inclination-balance type tester operating at a lower-spool speed of 12 inches per minute, and sized on a magnetically-damped yarn-numbering quadrant.

The yarns were graded for appearance by winding them on blackboards and comparing them with the standards developed by the U. S. Department of Agriculture in cooperation with the American Society for Testing Materials.

It is important to note that in all respects, in both manufacturing and testing, the saw- and roller-ginned lots received identical treatment. The results are thus comparable in every respect, and any differences found, aside from the normal variations of sampling and mechanical errors, may be attributed directly to the method of ginning.

## Results

Triplicate lots were used for each picking and each type of ginning in order to furnish results of greater reliability and to show something of the variation in results for each picking and ginning method. The most representative values for use in making comparisons thus can be obtained by averaging the results from the three lots in each case.

Manufacturing waste. Table 2 shows in detail the percentages of manufacturing waste removed from the different saw- and roller-ginned samples produced from early- and late-season cotton, respectively. The averages for the three lots are also shown in each case. Figure 2 provides a comparison of these averages.

For both pickings, an average of about 1.8 percent more manufacturing waste was removed from the roller-ginned lint than the saw-ginned lint. This difference amounts to about 9 pounds per bale in waste removal and is equivalent to that usually found between Strict Low Middling and Middling cotton. On an average, the difference in waste was about twice as great for the early-season cotton as for the late-season cotton. In the case of the early-season cotton, the difference was in the form of flat strips, card motes and fly, and comber waste; for the late-season cotton, it was chiefly in the form of flat strips and card motes and fly, the average difference in comber waste being negligible. In most instances for both pickings, the differences in picker waste were too small to be of any significance.

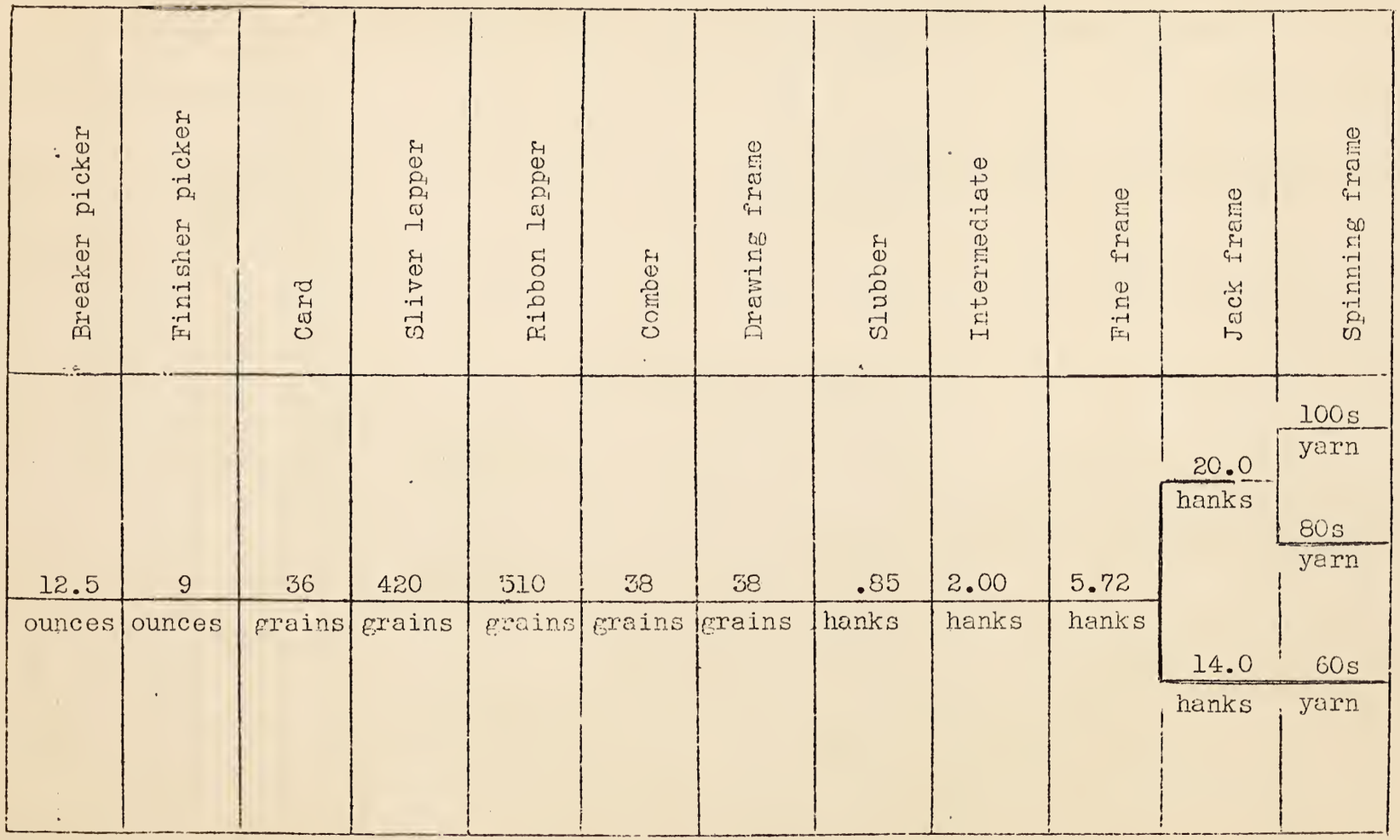


Figure 1.--Weight of stock made at each machine in manufacturing test yarns

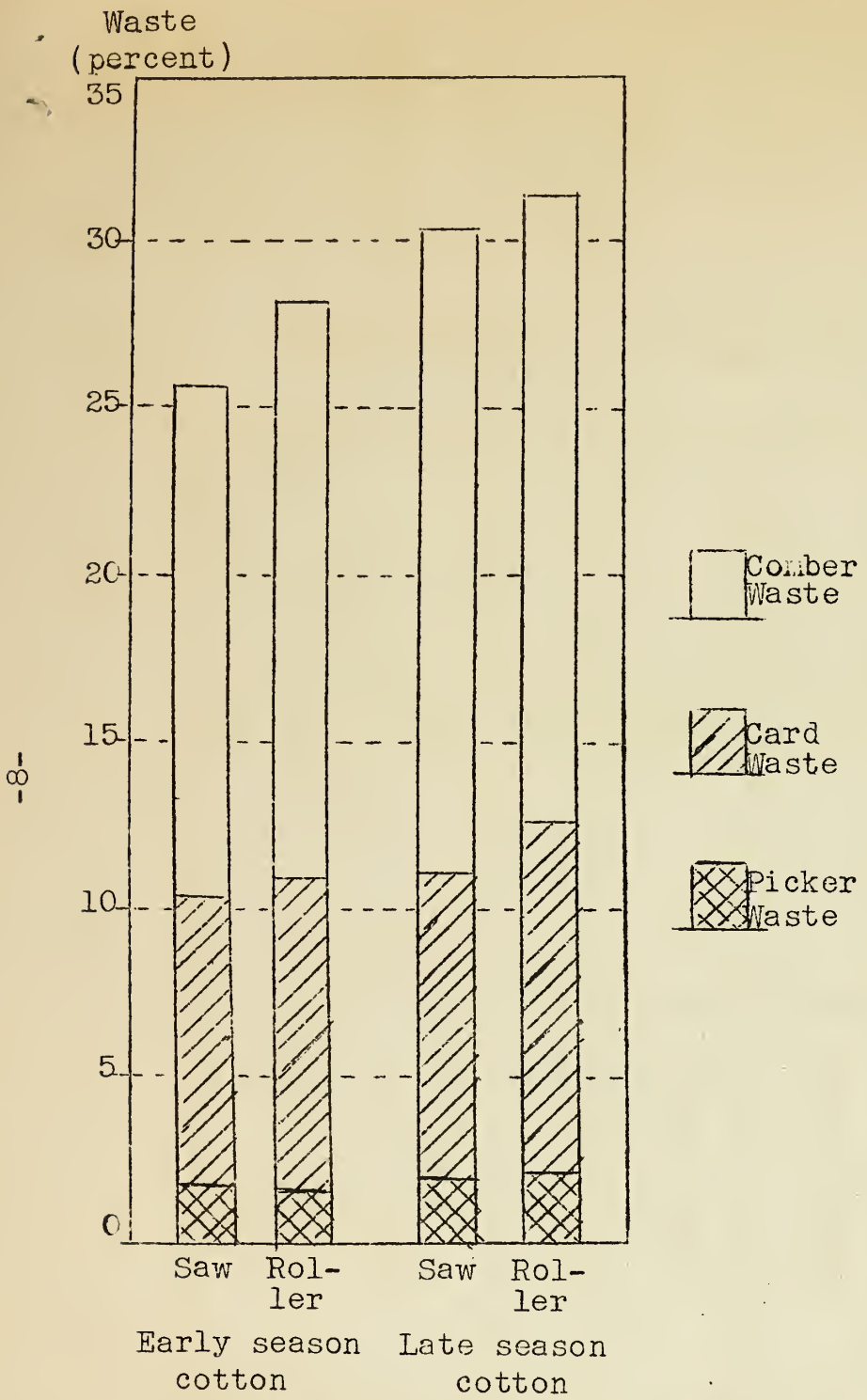


Figure 2 - Manufacturing waste removed from saw and roller ginned cottons. (Each bar represents the average of 3 test lots.)

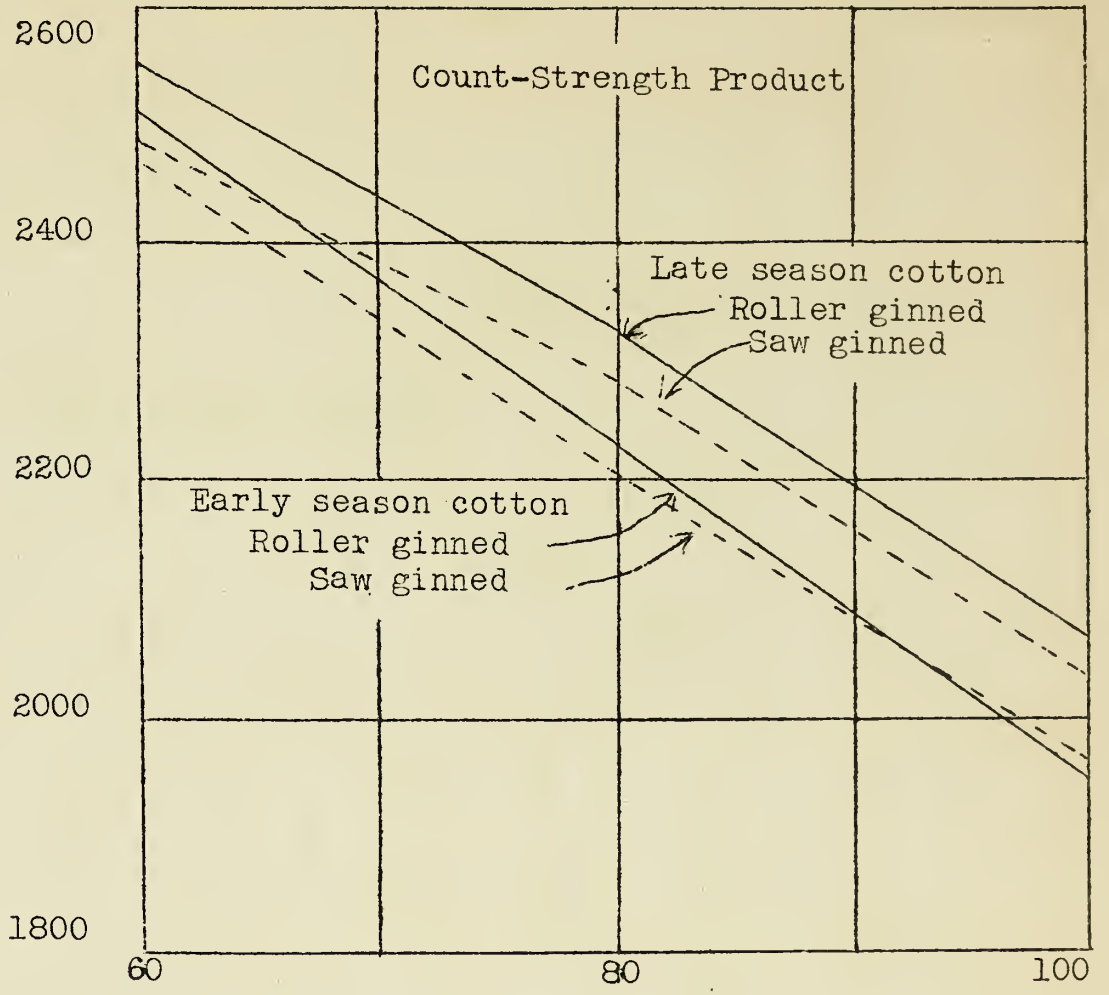


Figure 3 - Count-strength products for combed yarns spun from saw and roller ginned cottons. (Each plotted point represents the average of 3 test lots.)

Table 2. - Grade, manufacturing waste, and neps in card web for saw- and roller-ginned cotton from early- and late-season pickings 1/

| Item | Lot 1 | | Lot 2 | | Lot 3 | | Average | |
|---|---|---|---|---|---|---|---|---|
| | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned |
| Early-season cotton | | | | | | | | |
| Grade of cotton | Grade M | Grade SLM Sp. | Grade SM | Grade SM Sp. | Grade SM | Grade SM Sp. | Grade SM- | Grade M Sp. |
| Manufacturing waste: | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| Pickers | | | | | | | | |
| Breaker | 0.93 | 0.84 | 0.78 | 0.86 | 0.62 | 0.75 | 0.78 | 0.82 |
| Finisher | .86 | .78 | .87 | .54 | .61 | .52 | .78 | .61 |
| Card | | | | | | | | |
| Flat strips | 5.64 | 5.65 | 5.27 | 5.47 | 4.98 | 6.37 | 5.30 | 5.83 |
| C. D. strips | 2.14 | 1.94 | 2.02 | 1.84 | 1.87 | 2.12 | 2.01 | 1.97 |
| Motes and fly | 1.61 | 2.14 | 1.24 | 1.64 | 1.07 | 1.59 | 1.31 | 1.79 |
| Sweepings | .09 | .11 | .06 | .11 | .16 | .09 | .10 | .10 |
| Total | 9.48 | 9.84 | 8.59 | 9.06 | 8.08 | 10.17 | 8.72 | 9.69 |
| Total picker and card | 11.05 | 11.20 | 10.16 | 10.28 | 9.19 | 11.24 | 10.13 | 10.91 |
| Comber | 18.31 | 19.35 | 16.94 | 20.08 | 17.37 | 19.42 | 17.54 | 19.62 |
| Total picker, card and comber | 27.26 | 28.17 | 25.50 | 28.19 | 24.93 | 28.46 | 25.90 | 28.27 |
| | Number | Number | Number | Number | Number | Number | Number | Number |
| Neps per sq. in. of card web | .42 | .17 | .22 | .16 | .33 | .09 | .32 | .14 |
| Late-season cotton | | | | | | | | |
| Grade of cotton | Grade SLM | Grade SLM Sp. | Grade SLM | Grade SLM Sp. | Grade SLM | Grade SLM Sp. | Grade SLM | Grade SLM Sp. |
| Manufacturing waste: | Percent | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| Pickers | | | | | | | | |
| Breaker | 1.27 | 1.24 | 1.16 | 1.17 | 1.24 | 1.34 | 1.22 | 1.25 |
| Finisher | .75 | .75 | .67 | .90 | .77 | .91 | .73 | .85 |
| Card | | | | | | | | |
| Flat strips | 5.56 | 5.92 | 5.82 | 6.85 | 5.48 | 5.64 | 5.62 | 6.14 |
| C. D. strips | 1.85 | 1.95 | 1.91 | 2.22 | 1.83 | 1.91 | 1.86 | 2.03 |
| Motes and fly | 1.85 | 2.63 | 1.83 | 2.76 | 1.92 | 2.76 | 1.87 | 2.72 |
| Sweepings | .09 | .15 | .11 | .11 | .27 | .17 | .16 | .14 |
| Total | 9.35 | 10.65 | 9.67 | 11.94 | 9.50 | 10.48 | 9.51 | 11.03 |
| Total picker and card | 11.13 | 12.25 | 11.25 | 13.65 | 11.23 | 12.35 | 11.20 | 12.75 |
| Comber | 20.93 | 22.30 | 20.99 | 20.75 | 22.37 | 21.44 | 21.43 | 21.50 |
| Total picker, card and comber | 29.70 | 31.52 | 29.69 | 31.51 | 30.90 | 30.84 | 30.10 | 31.29 |
| | Number | Number | Number | Number | Number | Number | Number | Number |
| Neps per sq. in. of card web | .28 | .09 | .43 | .09 | .48 | .10 | .40 | .09 |

1/ The waste percentage for each cleaning machine is based on the net weight of cotton fed to that machine. The totals for picker and card, and picker, card, and comber are based on the weight fed to the breaker picker.

Yarn strength. The average strength of each count of yarn spun from each sample of cotton is shown in table 3. In the two right-hand columns are also shown the average strengths for the saw- and roller-ginned lots from each picking.

On an average, the yarns spun from the roller-ginned samples were 1.2 percent stronger than those spun from the saw-ginned samples. Although it is possible that from a statistical point of view such a difference may possess significance, it is difficult to imagine any point in the course of manufacturing, or any type of goods for which these yarns would be used, in which a difference of 1.2 percent in strength would have much if any practical significance. There are probably a number of places in the average commercial plant at which minor mechanical changes, here and there, would have a greater effect upon the strength of the product than was found to be the result of the different methods of ginning in this study.

In terms of the count-strength products for the three counts of yarn spun, figure 3 shows graphically the average yarn strengths for each group of lots. This chart indicates rather clearly that the differences attributable to ginning methods are more pronounced in the case of late-picked cottons.

The strength of the yarn that can be spun from a cotton is probably the most important single index of its spinning quality. In this series of tests, it may be concluded that for all practical purposes, as far as yarn strength is concerned, it is immaterial whether the cottons were ginned on a saw or a roller gin.

It is of interest to note that although the classers found the late-season cotton to be 5/32 to 3/16 inch shorter in staple than the early-season cotton, the late-season cotton produced yarns that averaged 3.2 percent stronger than those from the early picked cotton. The differences were relatively greater in the finest counts than in the coarsest.

Yarn appearance. In addition to waste, table 2 shows the average number of neps per square inch of card web for each lot tested, and for the average of the triplicate lots. It may be seen that for the early picking, the number of neps per unit area of card web was about twice as great for the saw-ginned cotton as for the roller-ginned, and about four or five times as great for the saw-ginned as for the roller-ginned in the late-season cottons. Although neppiness is only one of three elements that affect the appearance of yarns, such a difference would be expected to be reflected in the appearance grade. That such is the case is seen by the yarn appearance grades in table 3. For the early picked cotton, the roller-ginned lots averaged 1/3 grade higher than the saw-ginned lots, whereas for the late-season cotton the roller-ginned lots averaged from 1/3 to 2/3 grade higher, the greater difference being noted in the finer yarns.

The differences in yarn appearance in favor of the roller-ginned lots cannot be ignored, as they are not only consistent but for some kinds of threads and fabrics might be rather importance. It is believed, however, that a difference of only 1/3 grade would be within the control of the mill; that is, by reasonable changes in card production or comber waste, changes of 1/3 grade can be effected

Table 3. - Staple length, and yarn strength and appearance for saw- and roller-ginned cotton from early- and late-season pickings 1/

| Item | Lot 1 | | Lot 2 | | Lot 3 | | Average | |
|---|---|---|---|---|---|---|---|---|
| | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned | Saw-ginned | Roller-ginned |
| **Early-season cotton** | | | | | | | | |
| Staple length | Inches 1-3/8 | Inches 1-3/8 | Inches 1-3/8 | Inches 1-3/8 | Inches 1-11/32 | Inches 1-3/8 | Inches 1-3/8 | Inches 1-3/8 |
| Strength of yarn | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| 60s yarn | 41.98 | 41.86 | 41.06 | 41.42 | 40.24 | 42.00 | 41.09 | 41.76 |
| 80s yarn | 27.56 | 27.88 | 27.58 | 28.14 | 27.44 | 27.54 | 27.53 | 27.85 |
| 100s yarn | 19.68 | 19.44 | 19.72 | 19.44 | 19.66 | 19.58 | 19.69 | 19.49 |
| Appearance of yarn: | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade |
| 60s yarn | B- | B | B+ | B+ | B | B+ | B | B+ |
| 100s yarn | C | C+ | B- | B- | C+ | B- | C+ | B- |
| **Late-season cotton** | | | | | | | | |
| Staple length | Inches 1-3/16 | Inches 1-3/16 | Inches 1-7/32 | Inches 1-7/32 | Inches 1-7/32 | Inches 1-7/32 | Inches 1-7/32- | Inches 1-7/32- |
| Strength of yarn | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| 60s yarn | 41.44 | 41.94 | 41.04 | 42.54 | 41.78 | 42.66 | 41.42 | 42.38 |
| 80s yarn | 28.56 | 28.56 | 28.40 | 29.34 | 28.58 | 29.14 | 28.51 | 29.01 |
| 100s yarn | 20.44 | 20.26 | 20.30 | 21.02 | 20.32 | 20.64 | 20.35 | 20.64 |
| Appearance of yarn: | Grade | Grade | Grade | Grade | Grade | Grade | Grade | Grade |
| 60s yarn | B- | B | C+ | B | B- | B | B- | B |
| 100s yarn | C- | C+ | C- | C+ | C | C+ | C- | C+ |

1/ The skein strength shown for each lot and yarn count is the average of the 50 observations, corrected to the specified count.

rather easily. Also, the general level of the yarn appearance grades for saw-ginned cottons, at least for the early season cotton, is quite satisfactory for most types of goods for which cotton of these staples is normally used.

From the standpoint of over-all spinning quality, the slightly poorer appearance of the yarns spun from the saw-ginned cottons is probably more than offset by the greater wastiness of the roller-ginned cottons in this series of tests.

General manufacturing performance. An analysis of detailed laboratory notes, made during the manufacture of the yarns and involving general observations of each lot of cotton on each machine, failed to reveal any important or consistent differences between the saw-ginned and the roller-ginned cottons. Rates of spinning end breakage were very low for all lots during the spinning of 60s and 80s yarn. In the case of the 100s yarn, two of the three lots exceeding eight ends down per 100 spindles per hour were roller-ginned cotton. Little significance should be attached to this, however, as the number of spindles and the time involved were too small to predict mill performance on this factor with much accuracy.

These observations may be summarized by saying that the general manufacturing performance was the same for the saw- and roller-ginned cottons.

## SUMMARY AND CONCLUSIONS

With the increased plantings of extra long staple Coker-Wilds cotton in the irrigated region of the Cotton Belt in 1942, cotton producers needed information on the relative merits of saw- and roller-ginning this cotton from the cotton manufacturer's standpoint. Since previously reported tests were confined to medium and relatively long staple cottons, additional ginning information relating to longer staple cottons was considered to be essential as a basis for more definite conclusions with respect to comparative spinning quality of saw- and roller-ginned Coker-Wilds cotton grown under irrigation. Consequently, a series of saw- and roller-ginning tests were made on three early- and three late-season harvested lots of Coker-Wilds cotton in Esperanza, Tex., in 1942, under commercial conditions of gin operation, to provide lint for comparative classification, fiber and spinning determinations.

The results of these tests on Coker-Wilds cotton, stapling about 1-3/8 inches early in the season and 1-7/32 inches in length late in the season, may be summarized and conclusions derived as follows:

1. The roller-ginned samples were classed as "Spotted" and rough, and averaged more than a grade lower than the saw-ginned samples. On an average, they were about the same in fiber length, as determined through classification and fibrograph measurements.

2. Roller ginning showed an average increase in lint turn-out of 6 pounds per bale, compared with saw ginning, by placing in the lint extra materials composed primarily of foreign matter, aborted seed motes, and short fibers.

3. With the extraneous material in the roller-ginned cotton, there was associated, on the average, an increase of 9 pounds per bale in manufacturing waste (picker, card, and comber waste) over that removed from the saw-ginned lint. This difference in waste is equivalent to that usually found between Strict Low Middling and Middling cotton.

4. Combed yarns spun from the roller-ginned lots were on an average 1.2 percent stronger than those spun from the saw-ginned lots, but such a difference is too small to be of any practical significance either in the efficiency of manufacturing or in the strength or durability of threads and fabrics made from the yarns.

5. The somewhat greater nep content of the saw-ginned lint was reflected to some extent in the appearance of the yarns. For the early season cotton, the yarns spun from the roller-ginned lint were about 1/3 grade higher, and for the late-season cotton, from 1/3 to 2/3 grade higher than those spun from the corresponding saw-ginned lint. From the manufacturer's point of view, such a difference is small, and is controllable fairly readily in the mill.

6. Whether or not the slight advantage in yarn appearance for the roller-ginned cotton is outweighed by the smaller waste yield of the saw-ginned cotton would depend upon the type of goods to be made in a particular instance. All things considered, however, the saw-ginned lint would probably be as desirable as the roller-ginned lint for the general run of goods made from this type of cotton.

7. Differences in ginning costs must also be taken into account in determining the relative over-all merits of the two methods of ginning Coker-Wilds cotton. With this cotton, ginning capacity of saw gins is 10 times that of roller gins and, consequently, ginning costs would show a wide difference for the two methods of ginning. Prevailing charges for ginning, which gave saw ginning an approximate 2 to 1 advantage, apparently do not adequately reflect the difference in actual cost of ginning by the two methods.